

REMARKS

Claims 1-11 are pending in the application. Claims 1-11 stand rejected. The formal drawings were filed and accepted on June 21, 2004. The Examiner's rejections are addressed below in substantially the same order as in the office action. Amendments to the claims have been made herein to correct clerical errors or to provide proper antecedent basis.

The Examiner has stated that the amendments to claims 2, 8, and 9 filed September 27, 2005 are sufficient to overcome the U.S.C. 112 rejections of the previous office action.

Request to Withdraw Final Rejection

The Examiner has stated that Applicant's arguments with respect to claims 1-11 have been considered but are moot in view of the new grounds for rejection. However the Examiner has made this office action as Final. Applicants submit that rejecting claim 11 as final on new grounds in view of Anderson reference is premature because it is not an art submitted under 37 CFR 1.97(c). Accordingly, Applicants request that the final rejection be withdrawn.

REJECTIONS UNDER 35 USC § 103

Claims 1-5, 7-9, and 11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Cecconi et al. (US 6,614,718) in view of Andersen (US 5,410,517).

Claim 1 is an independent claim. Claims 2-9 depend on claim 1. With respect to claim 1, the Examiner's position is that Cecconi et al. "discloses computing an arrival time for the detected seismic signals in the seismic receiver (Column 1, lines 12-17; Column 3, lines 50-63)." Applicants, respectfully disagree that Cecconi et al. discloses or suggests computing an arrival time for the detected seismic signals in the seismic receiver anywhere in the disclosure.

Column 1, lines 12-17:

These waves are detected by a sensor, like a hydrophone, geophone, or accelerometer. The direct and indirect propagation times allow the vertical seismic profile and the position of seismic reflectors located under the drill bit to be calculated. In order to perform these calculations of position, at least two of these sensors must be available, one of which is arranged above ground and the other one is located downhole.

Inspection of this passage indicates that there is no language in Column 1, lines 12-17 that discloses or suggests computing an arrival time for the detected seismic signals in the seismic receiver.

Additionally, Column 3, lines 50-63 is reproduced below:

The top diagram of FIG. 2 represents a wave form transmitted by source 6, as it is retrieved by the reference geophone 8, the bottom diagram illustrates that tool 12 is receiving the wave twice, firstly through the direct path 14 of the incident wave, after a time $\Delta 1$, and secondly through the reflected path 15 after the additional time $\Delta 2$; as the reference geophone 8 is close to the seismic source 6, it receives the shock wave almost immediately, and the length of the direct path 14 is proportional substantially to $\Delta 1$, that of the reflected path 15 to the sum $(\Delta 1 + \Delta 2)$. A sufficient number of these measurements, repeated for various readings of tool 12 (in general, one measurement every 10 m), allows to determine the position of interface 13. However, it is necessary for the measurements of the reference geophone 8 and the sensor located inside tool 12 to be synchronized with very high precision for the measurement of $\Delta 1$ to be correct.

Again, as may be seen, there is nothing in Column 3, lines 53-65 that discloses or suggests computing an arrival for the detected seismic signals in the seismic receiver as called for in claim 1. Also, there does not appear be any language disclosing or suggesting computing an arrival for the detected seismic signals in the seismic receiver anywhere in the Cecconi et al. reference.

In order to sustain an obviousness rejection under 35 USC § 103, two requirements must be met. First, the prior art of record must disclose all the limitations of the claimed invention. Cecconi et al. and Andersen taken alone or in combination do

not disclose or suggest all of the limitations of claim 1. Applicants submit that no art of record either alone or when combined with other art of record discloses or suggests all the limitations of claim 1. Further, there is no suggestion to combine there the prior art of the present case to form the present invention. Accordingly, Applicants respectfully submit that claim 1 and the claims that depend from claim 1, (Claims 2-9), are allowable over the prior art of record.

The Examiner's position is that Cecconi et al. discloses "processing the near-source signals and the seismic receiver detected signals according to programmed instructions to generate a seismic map (Column 1, lines 1-20; Column 4, Lines 28-65). Applicants respectfully disagree that such is disclosed by Cecconi et al. As for Column 1, lines 1-20, this passage indicates that "The direct and indirect propagation time allow the vertical seismic profile and the position of seismic reflectors located under the drill bit to be calculated." However, this is not a disclosure of "processing the near-source signals and the seismic receiver detected signals according to programmed instructions to generate a seismic map" as called for in claim 11. Additionally, Column 4, lines 28-65 contain no disclosure related to the processing of acquired seismic data. Therefore, Cecconi et al. does not disclose "processing the near-source signals and the seismic receiver detected signals according to programmed instructions to generate a seismic map" as called for by claim 11.

Cecconi et al. and Andersen taken alone or in combination do not disclose or suggest all the limitations of the claimed invention. Applicants submit that no art of record either alone or when combined with other art of record discloses or suggests all the limitations of claim 11. Also, there is no suggestion to combine the prior art of the present case to form the present invention. Additionally, there is no suggestion or teaching in Cecconi et al. to motivate any combination with Andersen. Further, there is no suggestion or teaching in Andersen to motivate a combination with Cecconi et al. Accordingly, Applicants respectfully submit that claim 11 is allowable over prior art of record.

With respect to claims 6 and 10, the Examiner's position is that these claims are rejected under 35 U.S.C. 103(a) as being unpatentable over Cecconi et al. (US 6,614,718) in view of Andersen (US 5,410,517) as applied to claims 1-5, 7-9, and 11 above and further in view of Robbins et al. (US 6,131,694).

With respect to claim 6, Applicants' submit that claim 6 depends from claim 1 and is therefore allowable for the reasons stated above (and Robbins et al. is not cited against claim 1 in the instant office action).

Claim 10 is a method claim that recites: generating coded seismic signals from a surface location; detecting coded seismic signal with a sensor in a seismic receiver (downhole); computing in the seismic receiver (i.e., downhole) a checkshot transit time for the coded seismic signals; and transferring the checkshot transit time to the surface. The Examiner clearly admits that Cecconi et al. (the primary reference by the Examiner) does not disclose most of the limitations of claim 10. Examiner states that Cecconi et al. (i) does not disclose that the signals are coded signals and (ii) does not disclose computing in the seismic receiver a checkshot transit time for the detected seismic signals", and (iii) does not disclose transferring of the downhole computer checkshot transmit time to the surface, which are essentially all of the recitations of claim 1.

The Examiner is relying on Andersen for the proposition that coded signals can be generated and that Cecconi et al. discloses a way to determine checkshot transit time. Applicants, submit that none of the references disclose or suggest at least: computing the checkshot transit time "in the receiver" (i.e., downhole); or transferring the downhole computed checkshot transit time to the surface.

Applicants also submit that the receiver disclosed in Cecconi et al. is not shown to be capable of computing the checkshot transit time downhole. Further, neither Andersen nor Robbins et al. discloses the above-mentioned recitations. Additionally, there is no suggestion or motivation to combine the elements in Robbins et al. with the elements of Cecconi et al. and Andersen. Thus, Applicants respectfully submit that the claim 10 as a whole is not disclosed by any of these references taken alone or in any combination, and therefore claim 10 is allowable over these references and the other prior art of record.


In view of the above, Applicants respectfully submit that claims 1-11 are allowable over the prior art of record and requests an early notice of allowance.

CONCLUSION

For all the foregoing reasons, Applicant submits that the application is in a condition for allowance. No fee is believed due for this paper. The Commissioner is hereby authorized to charge any additional fees or credit any overpayment to Deposit Account No. **02-0429 (414-35351-US)**.

Respectfully submitted,

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CERTIFICATE OF FACSIMILE TRANSMISSION

I do hereby certify that this correspondence is being transmitted via facsimile, to the Commissioner for Patents, Examiner Scott A. Hughes, facsimile no. (571) 273-8300, on this 21st day of February 2006.


Beth Pearson-Naul